AMENDMENTS TO THE CLAIMS

1. (Original)

A method of assembling a check valve into a tube of deformable material, which comprises:

(a) expanding an end portion of said tube,

(b) forming a valve seat within said end portion expanded in said step (a) where the expanded end portion joins the remainder of the tube,

(c) positioning a valve element within said expanded end portion with said element seated against said seat, and

(d) deforming said end portion by reducing the diameter of a portion of said end portion to form a valve casing cavity operable to capture said valve element within said tube for operably opening and closing against said seat by movement of said valve element in said cavity.

2. (Currently Amended)

The method of claim ~~1~~ 19 wherein the step (a) of expanding the end portion of the tube is performed by head forming expansion apparatus having an expanding mandrel operable to be inserted endwise into the open outlet end of the tube.

3. (Currently Amended)

The method of claim ~~2~~ 15 wherein the expansion operation is performed in two stages to progressively head form expand the end portion of the tube to a final diameter to form the casing wall of the valve cavity for the valve element.

4. (Currently Amended)

The method of claim ~~1~~ 19 wherein step (c) includes providing an installation tool having a shank and fold out fingers to operably force the valve element against the valve seat, such fingers having feet that hold the fingers in an expanded outward position, the fingers being pivotable to collapse the same for withdrawal from the tube after step (d) is performed.

5. (Currently Amended)

The method of claim ~~1~~ 19 wherein step (d) is performed in an end form swaging operation wherein the outlet end of the tube and a shrinking die are forced together to cold work the tubular stock back down to a final diameter.

6. (Original)

The method of claim 1 wherein the final diameter formed in step (d) is no less than the diameter of the upstream nominal stock diameter of the tube starting material.

7. (Original)

The method of claim 1 wherein the final expanded section of the tubing expanded in step (a) has a diameter approximately 25% greater than the nominal diameter of the starting tube material.

8. (Original)

The method of claim 1 wherein the valve element comprises a check ball having a diameter only slightly larger than that of the nominal tube stock diameter of the starting material.

9. (Currently Amended)

The method of claim ~~1~~ 19 wherein step (c) also includes positioning a coil compression valve spring within said expanded end portion and engaging said valve element when said valve element is seated against said seat, and wherein step (d) also captures said valve spring within said cavity with said spring in compression holding said valve element against said seat.

10. (Original)

The method of claim 9 wherein step (c) includes providing an installation tool having a shank and fold out fingers to engage an end coil of said coil compression spring and these fingers having feet that hold the fingers in an expanded outward position, and

the feet are pivotable to collapse the same for withdrawal from the tube after step (d) is performed.

11. (Withdrawn)

An in-line integrated tube and check valve assembly that comprises:

an elongated hollow tube having an integrally formed tube wall at a nominal diameter,

said tube wall forming an enlarged cavity spaced from one end of said tube, said cavity having a cross sectional dimension greater than said nominal diameter,

said tube wall forming a valve seat at one end of said cavity,

a valve element in said cavity, and

a valve spring captured in compression in said cavity holding said valve element against said seat.

12. (Withdrawn)

The assembly of claim 11 wherein said tube wall has a cylindrical portion extending from an outlet end of the tube axially to the enlarged cavity and having a shoulder junction therewith that provides a stop seat for one end of said valve spring.

13. (Withdrawn)

The apparatus of claim 12 wherein said tube wall cylindrical portion has a diameter substantially the same as the nominal diameter of the tube wall.

14. (Withdrawn)

The assembly of claim 13 wherein the diameter of the enlarged cavity is about 25% greater than the nominal diameter.

15. (New)

A method of assembling a check valve into a tube of deformable material, which comprises:

(a) expanding an end portion of said tube,

(b) forming a valve seat within said end portion expanded in said step (a) where the expanded end portion joins the remainder of the tube,

(c) positioning a valve element within said expanded end portion with said element seated against said seat, and

(d) deforming said end portion by reducing the diameter of a portion of said end portion to form a valve casing cavity operable to capture said valve element within said tube for operably opening and closing against said seat by movement of said valve element in said cavity,

wherein the step (a) of expanding the end portion of the tube is performed by head forming expansion apparatus having an expanding mandrel operable to be inserted endwise into the open outlet end of the tube.

16. (New)

A method of assembling a check valve into a tube of deformable material, which comprises:

(a) expanding an end portion of said tube,

(b) forming a valve seat within said end portion expanded in said step (a) where the expanded end portion joins the remainder of the tube,

(c) positioning a valve element within said expanded end portion with said element seated against said seat, and

(d) deforming said end portion by reducing the diameter of a portion of said end portion to form a valve casing cavity operable to capture said valve element within said tube for operably opening and closing against said seat by movement of said valve element in said cavity,

wherein step (c) includes providing an installation tool having a shank and fold out fingers to operably force the valve element against the valve seat, such fingers having feet that hold the fingers in an expanded outward position, the fingers being pivotable to collapse the same for withdrawal from the tube after step (d) is performed.

17. (New)

A method of assembling a check valve into a tube of deformable material, which comprises:

(a) expanding an end portion of said tube,

(b) forming a valve seat within said end portion expanded in said step (a) where the expanded end portion joins the remainder of the tube,

(c) positioning a valve element within said expanded end portion with said element seated against said seat, and

(d) deforming said end portion by reducing the diameter of a portion of said end portion to form a valve casing cavity operable to capture said valve element within said tube for operably opening and closing against said seat by movement of said valve element in said cavity,

wherein step (d) is performed in an end form swaging operation wherein the outlet end of the tube and a shrinking die are forced together to cold work the tubular stock back down to a final diameter.

18. (New)

A method of assembling a check valve into a tube of deformable material, which comprises:

(a) expanding an end portion of said tube,

(b) forming a valve seat within said end portion expanded in said step (a) where the expanded end portion joins the remainder of the tube,

(c) positioning a valve element within said expanded end portion with said element seated against said seat, and

(d) deforming said end portion by reducing the diameter of a portion of said end portion to form a valve casing cavity operable to capture said valve element within

said tube for operably opening and closing against said seat by movement of said valve element in said cavity,

wherein step (c) includes positioning a coil compression valve spring within said expanded end portion and engaging said valve element when said valve element is seated against said seat, and wherein step (d) also captures said valve spring within said cavity with said spring in compression holding said valve element against said seat, and

wherein step (c) includes providing an installation tool having a shank and fold out fingers to engage an end coil of said coil compression spring and these fingers having feet that hold the fingers in an expanded outward position, and the feet are pivotable to collapse the same for withdrawal from the tube after step (d) is performed.

19. (New)

The method set forth in claim 1 that includes the step, prior to said step (a), of providing said tube having said end portion of uniform wall thickness.